New Stuff to Refract With, New Stuff to Prescribe... Gimmick or Gold?

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Western University College of Optometry
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Disclosure
- As a paid speaker I have not been sponsored by any companies mentioned in this lecture
- I am not a consultant to nor an employee of any ophthalmic company.

Course Objectives
- As a busy practitioner it's difficult to keep up with the latest and greatest in the industry.
- This course looks at refraction, dispensing and lens technology that may change the way we examine patients and prescribe lenses now and in the future.

Thoughts...
- From a practitioner's perspective
  - Why do I need this technology?
    - Improve care
    - See more patients
    - Increased reimbursement
  - How will it help my practice?
    - Word of mouth from established patients
    - Drive new patients to my practice (websites)
  - What is my return on investment (ROI)?
  - Am I an early adopter?

VMAX INTEGRATED VISION SYSTEM
Most Accurate Refraction + Best Vision Corrective Lenses =
Happy Patients + Higher Profitability + Practice Differentiation

Vmax Vision Provides an Integrated Vision System

What VMAX Offers the Eye Care Professional
- The Most Accurate, Fast, Easy, and Trustworthy Refraction
- The Highest Quality Corrective Lenses- Higher Definition Vision (Better Patient Care)
- A Game-Changer for Optometric Practices;
  - Improved Patient Flow
  - Enabling the selling of more Vmax Premium products
  - Clear Differentiation for the Vmax Practices
  - Reduce lens order errors, and re-dos
  - Retains and attract new patients
What VMAX Offers Patients

- Premium Products and Services
- Best Possible Vision
- Most Intuitive, comfortable, and easy eye exam

Snellen Letters vs. PSF

- Snellen acuity is only recognition/identification
- Need more sensitive testing
- Point Spread Function (PSF) fits that need
- No discernable difference can be observed with Snellen eye chart at 0.05 D change

PSF Refractor Characteristics

- Reliability is equal or better than phoropter
- Vmax Refraction method is Intuitive
- Short learning curve: 2 hours of training. Takes 20 patients to become proficient
- Ideal for delegating refraction to technicians (Extremely desirable for MD practices)

Clinical Trials

- In a clinical trial of 900 patients, using the Vmax PSF high fidelity refractor:
  
  - 1 in 3 patients stated improved visual acuity when compared to the doctor's phoropter manifest.

Clinical Trial of PSF and Encepsion Lenses

- 96% of patients attained better or equal visual acuity with PSF Refraction
- 4% of patients preferred Phoropter

Clinical Trial of PSF and Encepsion Lenses

- 90% of patients prefer the PSF refraction experience to phoropter
**Precise point by point correction on the front and back surfaces**
- All digital and computer controlled, minimizing polishing needs and power variences
- Progressive powers on both surfaces, increasing field of vision minimizing distortions

**Encepsion Lens Options**
- Designs: Fixed and Variable
- Corridor: from 11mm to 18mm
- Pantoscopic, Vertex Distance, Seg. Height
- Materials: All Standard, 1.60, 1.67, 1.70+, Trivex
- Transition, Polarized
- Lens Coating: Premium Only-2 Yrs warranty
  (Reflection Free, AR, Super Hydrophobic, Extra Tough Thermal Cure)
- Sport, Sun

**Vmax Business Model**
- We position Encepsion lenses as a high performance lenses, equal or better than the competition
- Encepsion lenses are priced at below the competitors to gain market share.
- Vmax provide further incentive to assist lens sales and PSF uses: Providing a rebate towards use fees for each pair of Encepsion sold.
- Usage Fee Model:
  - Standard $ 10 Click Fee
- Early Adopters:
  - $8 Base Click Fee with lower fees at higher click volume

**Subjective Refraction Limitations**
- Traditionally performed in normal room lighting
  - Pupils are small
  - High Contrast letters
  - Effects of Higher Order Aberrations missed
- The use of lenses in increments of + 0.25 D can result in rounding errors
- The Jackson Cross-Cylinder technique can lead to errors in the presence of HOA
- It is dependent on observation skills and the patient’s ability to respond
- Repeated measures of subjective refraction can differ by more than .50 D

**i.Scription® by ZEISS – The concept**
- Conventional Refraction – provides correction under ideal conditions, small pupil size = minimal blur
- Low light conditions and larger pupil sizes introduces more higher order aberrations = more blur
- i.Scription maximizes visual performance over a wide range of viewing conditions (pupil sizes) = minimized blur
A wavefront can be described in various ways. The most common and meaningful method is by using Zernike-Polynomials.

- With this description, every single error can be seen separately from all the others or from the total wavefront.
- Derived from the American ANSI Standards, there exists a first draft of an European Standard for wavefront description via Zernike-Polynomials.

\[
\begin{align*}
\zeta_0 & \quad \zeta_1 & \quad \zeta_0^2 + \zeta_2 & \quad \zeta_3 \\
\end{align*}
\]

Zernike-Polynomial

Total Wavefront

Correcting x-th order

Higher Order Errors

Aberrations for an area on a lens and for a pupil of 7mm diameter

Case 1: significant trefoil OD. Subject suffers from reduced vision at night.

<table>
<thead>
<tr>
<th>Eye</th>
<th>S (D)</th>
<th>C (D)</th>
<th>@ °</th>
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<tbody>
<tr>
<td>OD</td>
<td>-0.25</td>
<td>0.00</td>
<td>0°</td>
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The Power of Wavefront Refraction

- Wavefront refraction delivers much more information about the refractive properties of the eye than classical refraction, enabling the precise diagnostic and quantification of visual complaints such as reduced night vision.

Importance of Pupil Size on Image Quality

<table>
<thead>
<tr>
<th>Pupil Size (mm)</th>
<th>Image Quality</th>
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<tbody>
<tr>
<td>1</td>
<td>Poor</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
</tr>
<tr>
<td>4</td>
<td>Excellent</td>
</tr>
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</table>

Keratometry compared to Corneal topography

- Keratometry:
  - Cornea assumed to be spherical with no aberrations.
  - Steep K and Flat K are calculated.
  - 5 mm area measured.
  - Thousand points used for calculation.

- Corneal Topography:
  - Aberrations of the cornea are measured.
  - 3 mm or more area measured.
  - Thousand of points used for calculation.
  - Sleep K and Flat K are calculated.
  - The shape and topography of the cornea are determined.
  - Localized changes in the cornea can be detected.

Just as a corneal topographer provides more information about the cornea than a keratometer, an aberrometer provides more information about the optics of the eye than an autorefractor.
Case Study 1:
High Myope, Significant HOA

<table>
<thead>
<tr>
<th>Sphere</th>
<th>Cyl</th>
<th>Axis</th>
<th>OD</th>
<th>Cyl</th>
<th>Axis</th>
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</thead>
<tbody>
<tr>
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<td>-3.25</td>
<td>3</td>
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<tr>
<td>-9.07</td>
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<td>34</td>
<td>-5.79</td>
<td>-2.70</td>
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Manifest Refraction

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<tbody>
<tr>
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</tr>
<tr>
<td>OS</td>
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i.Scription

<table>
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<td>OS</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Results/Patient Feedback

62 year old woman
Traditional refraction
BSCVA = 20/30

With i.Scription
BSCVA = 20/20

Digital Surfacing LAB
Digital Measurements EQUIPMENT
Digital Designs PRODUCE

What is the Visioffice?

- Universal digital measuring system
- Frame selection
- Patient education
- Access to Varilux® personalized lenses

Why do I need the Visioffice System?

- Opportunity to provide unique patient experience
- Grow your practice and improve your mix
- Prepare your practice for the designs of the future

Optical Market Landscape is Changing
How will it impact my practice?

- Practices with the Visioffice system have experienced:
  - Overall practice growth
  - Improved mix of premium design, material, and AR coatings
  - Reduction in redos/remakes
  - Increased patient retention and capture rates
  - Increased patient satisfaction
  - Improved practice differentiation

How will it impact my patients?

- Comprehensive patient care
  - Personalized visual solutions meet their specific visual needs
  - Most accurate and precise measurements
  - Personalized patient education
  - Access to exclusive products including eyecode™ lenses

For more information

- On the importance of the Visioffice System, including options and costs: www.essilorvisioffice.com
- On the performance of Varilux Ipseo® and eyecode™ lenses: www.variluxusa.com

Introduction

Superfocus technology can significantly improve the quality of life for virtually everyone over the age of 50

- It works
- It is proven
- Customers love it
  - They tell us that it changes their lives
  - Once they experience Superfocus they say that they can never go back
- It addresses a market that is $10B/year in the U.S. alone
- It is completely unique and extraordinarily well-protected
- People have been trying to build this for over 150 years - no one else has even come close

Presbyopes Have Been ‘Getting By’...

Until now, the only choices have been:

- Multifocals
  - Multiple small focal zones create blurriness, image jump and distortion
  - Requires posture changes & “aiming” the head
  - Causes neck pain, headaches, nausea

- Multiple Single Vision
  - Inconvenient to carry/switch
  - Frequent loss

There had to be a better solution!
**Superfocus Wearers: Pleased! and Vocal**

- > 2,500 wearing Superfocus today
  ...75% purchased directly; 25% via ECP
- 95% say Superfocus correct their vision problems
- 83% are exceedingly pleased with their purchase
- 69% report feeling productive/effective when wearing them
- 68% say they recommend Superfocus

**Superfocus Technology is Revolutionary**

- Most recent design is 15th generation
- US Patents: 10 issued + 4 pending + 4 in draft
- Significant trade secrets and manufacturing know-how
- No comparable competition
- Opto-mechanical design
  - Optically accurate
  - Continuously variable focus
  - Robust, yet thin and light
- Practical/Appropriate
  - Touch-to-focus
  - Focus to any distance
  - Crystal clear view through entire lens
The Superfocus Advantage

- Better vision for a better life
- Ability to focus the entire lens to any distance
- Provides optimal focus / depth-of-field for any task
- Clarity throughout the full field of view
- Perfect focus regardless of daily fluctuations in vision
- Provides needed add as presbyopia progresses
- Wearers rediscover the vision of their youth

"The optics are fantastic."
-Richard Clompus, OD, FAAO
"These things are amazing!"
-VP Global Professional Affairs
"I am very happy with my new Superfocus and wear them all day, every day. Thanks."
-Dean, School of Optometry
"I am very happy with my new Superfocus and wear them all day, every day. Thanks."
-D.D., Illustrator
"They are much better than progressives."
-D.D.L., OD, PhD, FAAO - Dean, School of Optometry

70% or more of the day is arm’s length and beyond

Richard Clompus, OD, FAAO
-VP Global Professional Affairs
-PixelOptics
### Optical Lab

**Optical Lab**

**Total ADD**

<table>
<thead>
<tr>
<th>Prescription Range</th>
<th>sphere</th>
<th>cylinder</th>
<th>ADD</th>
<th>Rx prism</th>
<th>BC</th>
<th>Index</th>
<th>coating</th>
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</thead>
<tbody>
<tr>
<td>-7.00 to +4.00</td>
<td>-</td>
<td>up to -4.00</td>
<td>+1.25 to +2.75</td>
<td>up to 1.50 per eye</td>
<td>2.75/4.25/5.25</td>
<td>1.67</td>
<td>multi-layer AR</td>
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**ADD**

1.25 0.75 0.50 1.50 0.75 0.75 1.75 0.75 1.00 2.00 0.75 1.25 2.25 0.75 1.50 2.50 0.75 1.75 2.75 0.75 2.00

**Rx prism**

up to 1.50 per eye

**BC**

2.75/4.25/5.25

**Index**

1.67

**coating**

multi-layer AR

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**PAL Sphere**

**sphere**

-7.00 to +4.00

**cylinder**

up to -4.00

**ADD**

+1.25 to +2.75

**Rx prism**

up to 1.50 per eye

**BC**

2.75/4.25/5.25

**Index**

1.67

**coating**

multi-layer AR

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**spherical front surface**

**partial add power progressive back surface**

**liquid crystal electronic ADD**

**free form PAL**

**PAL Sphere**

**viewing through PAL**

**viewing through emPower!**
simple touch – on or off  swipe – auto mode

over-night charge lasts 2-3 days